

EXECUTIVE SUMMARY

In response to the February 13, 2001, staff requirements memorandum (SRM) for COMJSM-00-0003, "Staff Readiness for New Nuclear Plant Construction and the Pebble Bed Modular Reactor," this report assesses the readiness of the Nuclear Regulatory Commission (NRC) to process future applications for early site permits (ESPs), standard design certifications, and combined licenses (COLs) for commercial nuclear power plants, as well as reactivation of construction at deferred plants. Toward that end, this report provides resource and schedule estimates, without considering budget constraints, for NRC review of actions requested under several licensing scenarios that are believed to be representative of future applications and discusses staff critical skill gaps identified during the assessment. This report also discusses changes to the regulatory infrastructure that the staff is considering to support future licensing reviews, as well as organizational changes that are taking place to prepare for and manage future reactor and site licensing applications.

The overall conclusion of the staff performing the readiness assessment is that the NRC's licensing processes in 10 CFR Part 52 are ready to be used and the NRC is ready to complete new reactor licensing activities currently underway, such as the pre-application reviews for the AP1000 and the Pebble Bed Moderated Reactor (PBMR) and current rulemaking activities for 10 CFR Part 51 and Part 52. Additional work is needed in order to ensure the staff will be ready to effectively carry out its responsibilities associated with the review of ESPs, license applications, and construction of new nuclear power plants, given the potential for significant new licensing activity over the next several years. Staff decisions regarding the relative priorities of new reactor licensing activities will depend largely on the number and timing of industry decisions to pursue new licensing activities. In making its decisions, the staff will remain focused on the agency's Advanced Reactor Policy Statement and the performance goals of maintaining safety, protecting the environment and the common defense and security; increasing public confidence; making NRC activities and decisions more effective, efficient, and realistic; and reducing unnecessary regulatory burden.

Resource and Schedule Estimates

The report provides initial resource estimates for the following licensing scenarios:

- Pre-application review of the Westinghouse AP1000 advanced reactor design (Phase 2)
- Pre-application review of the PBMR design
- Pre-application review of the IRIS design
- Pre-application review of the GT-MHR design
- ESP review of an existing site
- ESP review of a new site
- Design certification for AP1000
- Design certification for IRIS
- COL for a standard certified design
- COL for PBMR
- Licensing of a reactivated plant

ABBREVIATIONS

ABWR	Advanced Boiling Water Reactor
ACI	American Concrete Institute
ACRS	Advisory Committee on Reactor Safeguards
AISC	American Institute for Steel Construction
ALARA	as low as reasonably achievable
ALWR	Advanced Light-Water Reactor
ANSI	American National Standards Institute
ARG	Advanced Reactor Group
ASCE	American Society of Civil Engineers
ASLB	Atomic Safety and Licensing Board
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing Materials
BWR	boiling water reactor
CANDU	Canadian Deuterium Uranium Reactor
CFR	Code of Federal Regulations
CIP	Construction Inspection Program
CIPIMS	Construction Inspection Program Information Management System
CNPP	corporate nuclear performance plan
COL	combined license
CP	construction permit
DAC	design acceptance criteria
DES	draft environmental statement
DET	Division of Engineering Technology
DOE	Department of Energy
DSARE	Division of Systems Analysis and Regulatory Effectiveness
EIS	environmental impact statement
EP	emergency preparedness
ER	environmental report
ESP	early site permit
ESRP	environmental standard review plan
EWG	exempt wholesale generators
FEMA	Federal Emergency Management Agency
FES	final environmental statement
FLIRA	Future Licensing and Inspection Readiness Assessment
FLO	Future Licensing Organization
FOAK	first-of-a-kind
FSAR	final safety analysis report
FTE	full-time employees
FY	fiscal year
GDP	gaseous diffusion plants
GT-MHR	Gas Turbine-Modular Helium Reactor
HLW	high-level waste
HR	Office of Human Resources
HTGR	high temperature gas-cooled reactor

ABBREVIATIONS

IAEA	International Atomic Energy Agency
ICRP	International Council on Radiation Protection
IEEE	Institute of Electrical and Electronics Engineers
IMC	inspection manual chapter
IPE	independent plant examination
IRIS	International Reactor Innovative and Secure
ISO	International Standards Organization
ITAAC	inspections, tests, analyses, and acceptance criteria
LWA	limited work authorization
LWR	light-water reactor
MHTGR	modular high temperature gas-cooled reactor
MOU	memorandum of understanding
MWe	megawatts electric
NEI	Nuclear Energy Institute
NEPA	National Environmental Policy Act
NMSS	Office of Nuclear Materials Safety and Safeguards
NOAA	National Oceanic and Atmospheric Administration
NRC	Nuclear Regulatory Commission
NRLPO	New Reactor Licensing Project Office
NRR	Office of Nuclear Reactor Regulation
OL	operating license
ORAT	operational readiness assessment team
PBMR	Pebble Bed Modular Reactor
PIUS	process inherent ultimate safety
PRISM	power reactor innovative small module
PSAR	preliminary safety analysis report
PWR	pressurized water reactor
QA	quality assurance
REAHFB	Regulatory Effectiveness Assessment and Human Factors Branch
RES	Office of Nuclear Regulatory Research
RF	Russian Federation
RSA	Republic of South Africa
SECY	Office of the Secretary of the Commission
SER	safety evaluation report
SNM	special nuclear material
SRM	staff requirements memorandum
SRP	standard review plan
SSC	systems, structures, and components
TEDE	total effective dose equivalent
TVA	Tennessee Valley Authority
USGS	U.S. Geological Survey
WNP-1	Washington Nuclear Project 1 or Energy Northwest Nuclear Project 1

II. REACTOR LICENSING SCENARIOS

In the past, nuclear power plants were licensed under a two-step licensing process set forth in the Commission's regulations in Title 10 of the *Code of Federal Regulations* (CFR) under Part 50. This process requires both a CP and an OL. However, 10 CFR Part 52 now provides several alternative licensing processes. The licensing processes in both 10 CFR Parts 50 and 52 are described below.

A 10 CFR Part 50

The licensing process under 10 CFR Part 50 has two review stages (i.e., it is a "two-step" licensing process). First, an application is submitted for a CP that would authorize construction of the proposed facility. The focus of this stage of the NRC staff's review is on the preliminary design of the facility and on the suitability of the proposed site. The second stage of the staff's review involves the evaluation of an OL application in which the staff reviews the final design of the plant, verifies its construction, and inspects the testing, operations, and emergency preparedness (EP) aspects of the review.

An applicant for a CP for a nuclear power plant generally submits the required information in three parts: (1) antitrust information, (2) an environmental report (ER) addressing site suitability, and (3) the preliminary safety analysis report (PSAR). In accordance with 10 CFR 50.33a, the antitrust information must be submitted at least 9, but no more than 36 months prior to the other required information to allow the U.S. Department of Justice and the NRC staff to begin the antitrust review. The ER generally precedes the PSAR by about 6 months. The NRC staff performs the environmental review of the application in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, to evaluate the potential environmental impacts of the proposed plant.

Although not required, NRC guidance states that a general introductory meeting should be held in the area of the proposed site about 6 to 12 months before the applicant submits the CP. The meeting is held to familiarize the public with the safety and environmental aspects of the proposed application, including the planned location and type of plant, the regulatory process, and the provisions for public participation in the licensing process. In addition, meetings with the applicant that are open to the public are frequently held to exchange information and discuss matters concerning the plant design and construction during the reactor licensing process.

When the NRC receives notification of an applicant's intentions to build a nuclear power plant, a pre-construction permit (pre-CP) inspection program is instituted. The program continues until the issuance of the CP. The pre-CP inspection effort focuses on the applicant's quality assurance (QA) program relative to implementation of ongoing design and procurement activities.

The ACRS reviews each application for a CP for a nuclear power plant and the associated safety evaluation report (SER). In addition, Section 189 of the Atomic Energy Act of 1954, as amended (Act), requires that a public hearing be held before a CP is issued for a nuclear power plant. As soon as practicable after an application has been docketed, the NRC issues a notice

of the hearing in accordance with 10 CFR 2.104(a). The hearing is held after the staff completes its review.

Opportunity is provided for members of the public to participate in the hearing. The public hearing is conducted by a three-member Atomic Safety and Licensing Board (ASLB). The staff's SER and its supplements, the final environmental impact statement (EIS), and staff testimony to address contentions constitute the staff's evidence at the hearing. Depending on the situation, either combined or separate safety and environmental hearings are held. In accordance with 10 CFR 2.786, the Board's initial decision is subject to a discretionary review by the Commission.

The NRC may authorize a licensee to do some work at the site before the CP is issued. This authorization is known as a limited work authorization (LWA). An LWA may be granted only after the licensing board, based on the record developed at a hearing, has (1) made all of the NEPA findings required by the Commission's regulations before issuing a CP, and (2) determined that there is reasonable assurance that the proposed site is a suitable location, from a radiological health and safety standpoint, for a nuclear power reactor of the general size and type proposed. The regulations provide for the authorization of two types of LWAs. One type, authorized under 10 CFR 50.10(e)(1), may authorize site preparation work, installation of temporary construction support facilities, excavation, construction of service facilities, and certain other construction not subject to the QA requirements of Appendix B to 10 CFR Part 50. The second type of LWA, authorized under 10 CFR 50.10(e)(3)(i), may authorize the installation of structural foundations and portions of the safety-related structures up to a level corresponding to plant grade. This type of LWA requires that the licensing board find that there are no unresolved safety issues with respect to these activities, in addition to the other required findings.

A construction inspection program (CIP) is conducted by the NRC. The purpose of the inspection process is to verify the acceptability of the completed plant and conformance with the applicable regulations.

When the construction of the nuclear plant has progressed to the point where final design information and plans for operation are available, the applicant submits the final safety analysis report (FSAR) and an updated ER to support an application for an OL in accordance with 10 CFR 50.34(b) and 10 CFR 51.53, respectively. The FSAR describes the facility's design basis and limits on its operation, and presents an analysis of the structures, systems, and components of the facility as a whole. The FSAR also provides plans for operation and procedures for coping with emergencies. The staff's conclusions on the applicant's offsite emergency plans are based on compliance with 10 CFR 50.47 and the staff's review of the findings from the Federal Emergency Management Agency (FEMA). FEMA reviews the plans to determine whether state and local emergency plans are adequate, and whether there is reasonable assurance that they can be implemented.

The OL for a nuclear reactor will contain technical specifications and an ER. The technical specifications contain, among other things, requirements for testing and operating the facility, and limiting conditions for plant operation. The ER sets forth the particular measures imposed on the plant to protect the environment.

Reactivated Plant Reviews

The 10 CFR Part 50 licensing scenarios examined in this assessment are the licensing of a plant that holds a currently valid CP and is to be reactivated from its deferred status, and the restarting of a plant with an OL. Four plants with CPs in a deferred status are candidates for reactivation: Bellefonte Units 1 and 2, Energy Northwest Nuclear Project 1 (WNP-1), and Watts Bar Unit 2. Browns Ferry Unit 1 has an OL and restarting of this unit, which last operated in 1985, is also considered in this assessment.

Plants with Construction Permits and SECY-89-104

SECY-89-104, "Assessment of Future Licensing Capabilities," discusses the reactivated plant scenario and discusses how the following would be implemented for a reactivated plant: the Commission's Policy on Deferred Plants, recent rule changes, and the Commission's Policy on Severe Accidents. Highlights of this discussion are provided below.

The Commission Policy Statement on Deferred Plants, published on October 14, 1987 (52 FR 38077), stated the Commission's expectation that CP holders would submit certain specific information when construction on a plant is deferred and when plant construction resumes. This information will be used by the staff to determine the status of the plant with respect to reactivated plant licensing. The acceptability of structures, systems, and components important to safety will be determined by the staff based upon the following: (1) staff review of the implementation of the previously approved preservation and maintenance program, (2) staff verification that design changes, modifications, and required corrective actions have been properly implemented, and (3) baseline inspections performed by the staff to verify that FSAR quality and performance commitments have been met.

In addition to performing the above reviews specifically associated with a reactivated plant and completing the review, inspection, and hearings associated with the 10 CFR Part 50 plant licensing process, SECY-89-104 states

[c]ertain rule changes and the Commission Policy on Severe Accidents are expected to affect the reactivated plant licensing review. The major changes include the Fire Protection Rule, the Hydrogen Rule, the Equipment Qualification Rule, and the Decommissioning Funding Rule.

To the extent that the applications for an OL for WNP-1 and Bellefonte were docketed before these rules were promulgated their applications would need to be updated to reflect these rule changes. Additional resource requirements related to financial qualifications and fitness for duty are similar to those discussed for new custom plant applications are equally valid for a reactivated plant licensing review.

In addition, bulletins and generic letters that have been issued since the time construction was deferred will also have to be addressed. With respect to severe accidents, SECY-89-104 states that licensing applicants for reactivated plants should

perform an Independent Plant Examination (IPE) as outlined in Generic Letter 88-20, and address containment vulnerabilities. As with currently operating reactors this will serve as the mechanism for addressing severe accidents for this licensing scenario.

The additional resource requirements and the potential hearing process impacts involving severe accident considerations will be similar to those discussed for new custom plant applications.

Browns Ferry Unit 1

Section V.G of this report contains background information on this unit. In addition, licensing resource estimates and schedule for reactivating plants with CPs and restarting Browns Ferry Unit 1 are provided in Section V.G.

B. 10 CFR Part 52

10 CFR Part 52 sets forth the processes for review of ESPs, standard design certifications, and COLs for nuclear power facilities licensed under Section 103 of the Atomic Energy Act. These three process alternatives to the two-step process set forth in 10 CFR Part 50 are described below. In addition, the staff can perform a pre-application review of a design to provide early feedback to an applicant on the acceptability of the design and its supporting testing and analysis programs, and to identify potential policy issues for Commission consideration. Also, Appendices M, N, O, and Q to 10 CFR Part 52 set forth the processes for manufacturing licenses, duplicate plant licenses, preliminary and final design approvals, and early review of site suitability issues, respectively. Figure II-1 provides an integrated diagram of the 10 CFR Part 52 licensing processes.

1. Pre-Application Review

The NRC's "Regulation of Advanced Nuclear Power Plants; Statement of Policy (10 CFR Part 50)" (51 FR 24643), established the Commission policy for advanced reactor designs. The Commission's advanced reactor policy statement has three primary objectives:

- (1) to encourage the earliest possible interaction of applicant, vendors, and government agencies with the NRC;
- (2) to provide all interested parties, including the public, with the Commission's views concerning the desired characteristics of advanced reactor designs, and;
- (3) to express the Commission's intention to issue timely comment on the implications of such designs for safety and the regulatory process.

The staff developed NUREG-1226, "Development and Utilization of the NRC Policy Statement on the Regulation of Advanced Nuclear Power Plants" (issued June 1988), to address public comments received on the advanced reactor policy statement and to provide guidance on advanced reactor design criteria.

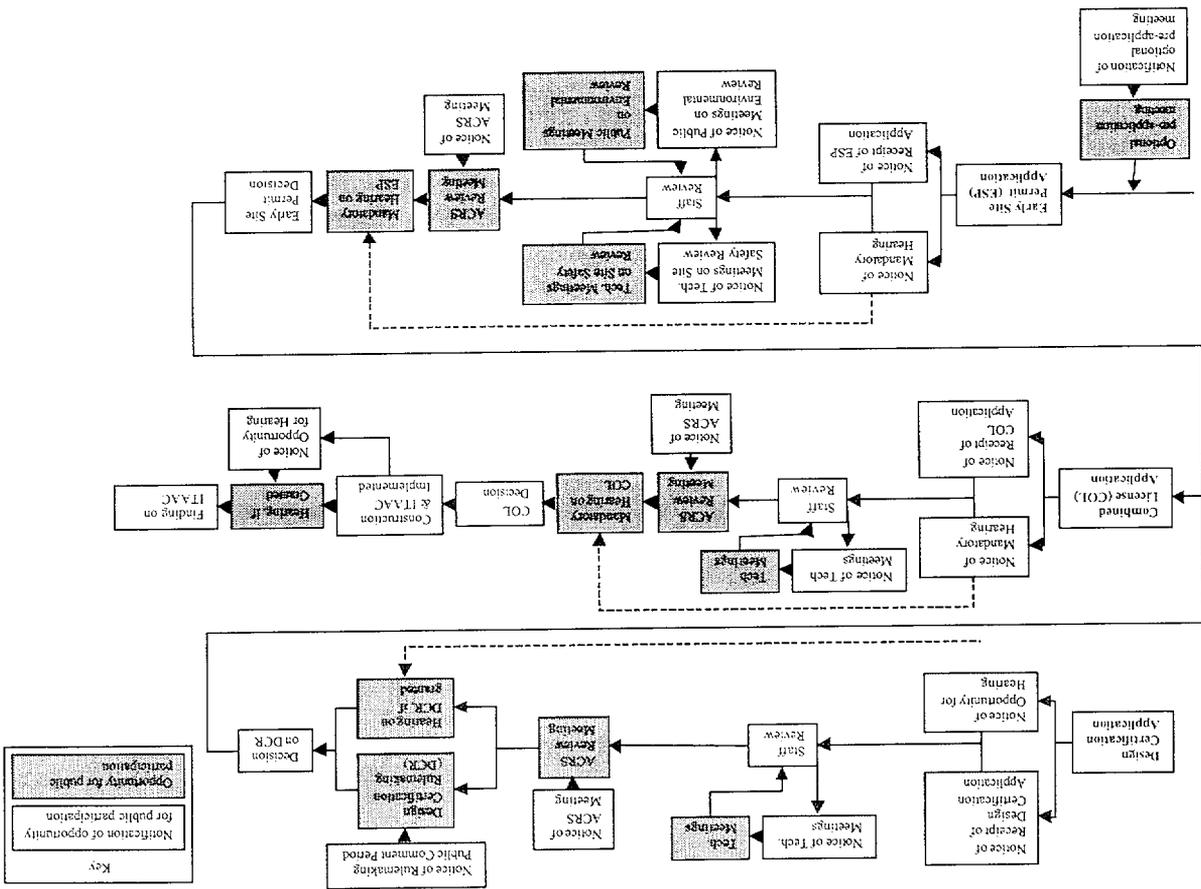


Figure II-1 - Part 52 Licensing Processes

In the early 1990s, the NRC conducted pre-application reviews of proposed advanced reactor designs to identify (1) major safety issues that could require Commission policy guidance, (2) major technical issues that the staff could resolve under existing regulations or NRC policy, and (3) the research needed to resolve identified issues. SECY-93-092, "Issues Pertaining to the Advanced Reactor (PRISM, MHTGR, and PIUS) and Canadian Deuterium Uranium Reactor (CANDU) 3 Designs and Their Relationship to Current Regulatory Requirements," April 8, 1993, summarized the issues identified for these reviews.

Based on recent discussions with the nuclear industry, the staff has identified four additional candidate designs for pre-application review in the near future. Two candidates, the Westinghouse AP1000 passive light water reactor (LWR, a larger version of the certified AP600 design) and the Exelon Generation Company gas-cooled PBMR, (based on the Eskom of South Africa PBMR) are currently under review by the staff. The staff expects pre-application review requests for the Westinghouse IRIS design (an integral LWR design) and the Gas Turbine Modular Helium Reactor (GT-MHR) (under development by General Atomics) to be submitted in FY 2002. The estimated review schedules for these pre-application reviews and the resources required to support these schedules are provided in Section V.C of this report.

2. Early Site Permit (ESP)

An application for an ESP is reviewed according to the applicable standards in 10 CFR Part 50 and its appendices and 10 CFR Part 100 as they apply to applications for CPs for nuclear power plants. Approval of an ESP is based on consideration of three key factors to determine whether the site is a suitable location on which to build a nuclear plant. These factors are (1) site safety, (2) EP, and (3) environmental protection. The ESP process is set forth in Subpart A of 10 CFR Part 52.

The application must contain a description and safety assessment of the site on which the facility is to be located. This assessment must contain an analysis and evaluation of the major structures, systems, and components of the facility that bear significantly on the acceptability of the site under the radiological consequence evaluation factors identified in 10 CFR 50.34(a)(1). Site characteristics must comply with the siting criteria of 10 CFR Part 100. In addition, the application should describe the following:

- (1) the number, type, and thermal power level of the facilities for which the site may be used;
- (2) the boundaries of the site;
- (3) the proposed general location of each facility on the site;
- (4) the anticipated maximum levels of radiological and thermal effluents each facility will produce;
- (5) the type of cooling systems, intakes, and outflows that may be associated with each facility;
- (6) the seismic, meteorologic, hydrologic, and geologic characteristics of the proposed site;

- (7) the location and description of any nearby industrial, military, or transportation facilities and routes; and
- (8) the existing and projected future population profile of the area surrounding the site.

10 CFR Part 52 provides two options for satisfying early site EP requirements. The application may either (1) propose major features of the emergency plans, such as the exact sizes of the emergency planning zones, that can be reviewed and approved by NRC in consultation with FEMA in the absence of complete and integrated emergency plans; or (2) propose complete and integrated emergency plans for review and approval by the NRC, in consultation with FEMA, based on the applicable provisions of 10 CFR 50.47.

The application must also include the information required by 10 CFR 52.17(b): (1) to identify physical characteristics unique to the site that could pose a significant impediment to the development of the emergency plans; (2) if the applicant chooses the first option, to describe contacts and arrangements made with local, state, and federal governmental agencies with emergency planning responsibilities, and (3) if the applicant chooses the second option, show that the applicant has made good-faith efforts to obtain from these agencies appropriate certifications with respect to the proposed emergency plans, or that such plans provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency.

In addition, the staff considers the environmental protection aspects of the application in accordance with 10 CFR 51.17(a)(2), and prepares an environmental impact statement (EIS) to describe the results of its review. The application need not include a discussion of the need for power, but must include an evaluation of alternative sites to determine whether there is any obviously superior alternative to the site proposed.

If, after being granted the ESP, an applicant wishes to be able to perform site preparation activities allowed by 10 CFR 50.10(e)(1) and 10 CFR 52.17(c) without first obtaining the separate authorization required by that section, the applicant must propose, in the ESP, a plan for redress of the site in the event that the activities are performed and the site permit expires before it is referenced in an application for a CP or a COL.

An ESP is considered to be a partial CP. Therefore, a mandatory public hearing must be held on the permit application in accordance with 10 CFR 52.21. The requirements for publication of notice of the hearing, the procedures for intervention, and the conduct of the hearing are the same as for a 10 CFR Part 50 CP application. However, depending on which EP option is selected, the hearing complexity may vary, along with support staff resources. In addition, in accordance with 10 CFR 52.23, the application for site approval must be referred to the ACRS, and the ACRS must report to the Commission on those parts of the application which concern safety.

The licensing resource estimates and schedule for an ESP are provided in Section V.D of this report.

3. Standard Design Certification

In accordance with 10 CFR 52.47(a)(i) and 10 CFR 52.48, an application for a standard design certification is reviewed for compliance with the standards set out in 10 CFR Parts 20, 50 (and its appendices), 73, and 100 as they apply to applications for CPs and OLs for nuclear power plants, as they are technically relevant to the design proposed for the facility. The design certification process is set forth in Subpart B of 10 CFR Part 52.

An application for design certification must contain:

- (1) the technical information that is required of applicants for CPs and OLs by 10 CFR Parts 20, 50 (and its appendices), 73 and 100, and is technically relevant to the design and not site-specific;
- (2) demonstration of compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f);
- (3) the site parameters postulated for the design and an analysis and evaluation of the design in terms of the parameters;
- (4) proposed technical resolutions of the unresolved safety issues and medium- and high-priority generic safety issues that are identified in the version of NUREG-0933, "A Prioritization of Generic Safety Issues, current on the date 6 months prior to the application and that are technically relevant to the design;
- (5) a design-specific probabilistic risk assessment;
- (6) proposed tests, inspections, analyses, and acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the tests, inspections, and analyses are performed and the acceptance criteria met, a plant that references the design will be built and will operate in accordance with the design certification;
- (7) the interface requirements to be met by those portions of the plant for which the application does not seek certification (these requirements must be sufficiently detailed to allow completion of the final safety analysis and required design-specific probabilistic risk assessment (Item 5));
- (8) justification that compliance with the interface requirements is verifiable through inspection, testing (either in the plant or elsewhere), or analysis (the method to be used for verification of interface requirements must be included as part of the required proposed tests, inspections, analyses, and acceptance criteria (item 6)); and
- (9) a representative conceptual design for those portions of the plant for which the application does not seek certification, to aid the staff in its review of the final safety analysis and probabilistic risk assessment, and to permit assessment of the adequacy of the interface requirements called for in Item 7 above.

In accordance with 10 CFR 52.47(b)(1), an application for certification of a nuclear power plant design that is an evolutionary advance on current light-water reactor designs must provide an essentially complete nuclear power plant design except for site-specific elements; for example, the service water intake structure and the ultimate heat sink.

In accordance with 10 CFR 52.47(b)(2), an application for certification of a standard design that differs significantly from current LWR designs or that utilizes simplified, inherent, passive, or other innovative means to accomplish its safety functions must provide sufficient information to confirm that:

- (1) the performance of each safety feature of the design has been demonstrated through either analysis, appropriate test programs, experience, or a combination thereof;
- (2) the interdependent effects among the safety features of the design have been found acceptable by analysis, appropriate test programs, experience, or a combination thereof;
- (3) sufficient data exist on the safety features of the design to assess the analytical tools used for safety analyses over a sufficient range of normal operating conditions, transient conditions, and specified accident sequences, including equilibrium core conditions; and
- (4) the scope of the design is complete except for site-specific elements, such as the service water intake structure and the ultimate heat sink.

As an alternative to the four items above, certification may be obtained by the acceptable testing of an appropriately sited, full-size prototype of the design over a sufficient range of normal operating conditions, transient conditions, and specified accident sequences, including equilibrium core conditions. If the criterion in item (4) above is not met, the testing of the prototype must demonstrate that the non-certified portion of the plant cannot significantly affect the safe operation of the plant. In either case, the application for final design approval of such a standard design must propose the specific testing necessary to support certification of the design.

In accordance with 10 CFR 52.47(b)(3), an application seeking certification of a modular design must describe the various options for the configuration of the plant and site, including variations in, or sharing of, common systems, interface requirements, and system interactions. The final safety analysis and the probabilistic risk assessment should also account for differences among the various options, including any restrictions that will be necessary during the construction and startup of a given module to ensure the safe operation of any module already operating.

In accordance with 10 CFR 52.53, the Commission refers a copy of the application to the ACRS. The ACRS reports to the Commission on those portions of the application that concern safety.

The NRC may certify and approve a standard plant design, which is independent of a specific site through a rulemaking. In addition to the opportunity for public participation on the design certification rulemaking, the NRC also provides the public with an opportunity to request an informal hearing in accordance with 10 CFR 52.51(b). The issues that are resolved in a design certification rulemaking are subject to a more restrictive change process than issues that are resolved through issuance of a license. In accordance with 10 CFR 52.63(a), the NRC cannot

change the design requirements for a certified design unless the modification is necessary to meet the applicable regulations in effect at the time of the design certification, or to assure adequate protection of the public health and safety.

Industry representatives have identified two near-term candidate designs for standard design certification review:

- (1) The Westinghouse AP1000 passive LWR, which is a larger version of the certified AP600 design. The licensing resource estimates and the schedule are provided in Chapter V.E.
- (2) The IRIS design, which is an integral-LWR design. The licensing resource estimates and the schedule are provided in Chapter V.E.

4. Combined License

As discussed previously, CPs and OLs are issued separately under 10 CFR Part 50. A combined CP and COL, issued under Subpart C of 10 CFR Part 52, authorizes construction and operation of the facility. In accordance with 10 CFR 52.73, an application for a COL under 10 CFR Part 52 can but need not incorporate by reference a design certification, an ESP, or both. The issues resolved by the design certification rulemaking process and those resolved during the ESP hearing process are precluded from reconsideration at the COL stage. In accordance with 10 CFR 52.81, an application for a COL is reviewed according to the standards set out in 10 CFR Parts 20, 50, 51, 55, 73, and 100 as they apply to applications for CPs and OLs for nuclear power plants, and as those standards are technically relevant to the design proposed for the facility.

In accordance with 10 CFR 52.79(c), the application for a COL must include the proposed inspections, tests, and analyses, including those applicable to emergency planning, that the licensee will perform. The application must also include the acceptance criteria that are necessary and sufficient to provide reasonable assurance that, if the inspections, tests, and analyses are performed and the acceptance criteria met, the facility has been constructed and will operate in conformity with the COL, the provisions of the Act and the NRC's regulations. Where the application references a certified standard design, the inspections, tests, analyses, and acceptance criteria for the certified design must apply to those portions of the facility design that are covered by the design certification. In addition, in accordance with 10 CFR 52.79(d), the application must contain emergency plans that provide reasonable assurance that adequate protective measures can and will be taken in the event of a radiological emergency at the site.

The application must contain all of the information required by 10 CFR 50.33, "Contents of Applications; General Information," as that section applies to applicants for CPs and OLs, and 10 CFR 50.33a, "Information requested by the Attorney General for antitrust review," as that section applies to an applicant for a nuclear power plant CP. The application must also demonstrate compliance with the requirements for training and qualification of nuclear power plant personnel established in 10 CFR 50.120 for the operating phase of the license.

In accordance with 10 CFR 52.79(a)(1), if the application references an ESP, the application need not contain information or analyses submitted to the Commission in connection with the

The licensing resource estimates and schedule for a review of a COL application that references a standard certified design and an ESP are provided in Chapter V.F(1) of this report. The licensing resource estimates and schedule for a review of a COL application that references a custom design (such as the Exelon Generation Company PBMR) and an ESP are provided in Chapter V.F(2) of this report.